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action of crystallization and diffusion, not accepting Becker's conclusion that diffusion would proceed so slowly as to be ineffective except for very short distances.

In chaps. vi-x, Harker discusses the crystallization of rock-magmas from their constituents on the basis of new data developed by Vogt, Tamman, Day, Allen, Wright, Adams, and others. He applies to the solution of the problems involved, the principles of physical chemistry as developed by Roozeboom, Ostwald, and Van't Hoff, and concludes that textures are in part due to these laws, and to the relation of the actual composition of the magma to that of the dominant eutectic.

In discussion of hybridism Harker denies the importance of magmatic assimilation except on the smallest scale and considers hybrid rocks to be a minor factor in the history and development of any igneous complex.

In his last chapter the author makes no attempt to present a new classification of rocks, although he says that the American quantitative classification marks a "retrograde movement, for here the artificial element is applied to the complete exclusion of the natural." He believes that the time is not yet ripe for a natural classification of igneous rocks, although he agrees with Becker that such a classification will probably be based upon the eutectics occurring in rocks, and he suggests further that it will involve the mode of development of various rock-types from a single parent magma through the action of differentiation; thus developing something which is comparable to the principle of descent used in the classification of animals and plants.

It appears therefore, that the book is an excellent summary of our present knowledge, and well suited for use with advanced students of petrology.

A. N. W.

Cambrian Geology and Paleontology. By CHARLES D. WALCOTT.
Cambrian Sections of the Cordilleran Area. From *Smithsonian
Miscellaneous Collections*, Part of Vol. LIII, pp. 167-230.
Ten plates. Washington, December 10, 1908.

This paper is a continuation of Dr. Walcott's study of the Paleozoic rocks of western North America. The object of this preliminary correlation is to show the interrelations of the Cambrian strata and faunas in the Cordilleran area, particularly in California, Utah, Nevada, Montana, and British Columbia. Five generalized sections are described in detail as to character and content. There seems to be a close relationship

between the Cambrian of Shantung, China, and the Cordilleran sections which the author will discuss in a future paper upon the Cambrian faunas of China.

C. J. H.

Studies of Frost and Ice Crystals. By WILSON J. BENTLEY. Reprinted from the *Monthly Weather Review* for August, September, October, November, and December, 1907. Jericho, Vt., 1907.

This interesting memoir on frost and ice crystals deals with their forms, structure, life-history, and general relations. It contains twenty pages of descriptive matter and thirty-one plates.

C. J. H.

Lime and Cement Resources of Missouri. By H. A. BUEHLER. Missouri Bureau of Geology and Mines, Vol. VI, 2d Series. 255 pp., 35 pls., map. Jefferson, 1907.

This report describes the raw materials used in the manufacture of lime and cement; their uses, properties, and methods of manufacture; also a general description (by counties) of the formations affording these materials.

C. J. H.

Geology and Physical Geography of East Greenland. By OTTO NORDENSKJOLD. Reprinted from "Meddelelser om Grönland," Vol. XXVIII, pp. 153-285, 4 colored plates. Copenhagen, 1908.

This reprint contains some of the observations of the Danish expedition of 1900. Many rock specimens were collected for petrographical study. The great central rock-mass of Greenland is crystalline, principally composed of primary gneisses, schists, syenites, porphyries, and basalts. Their age is early Archean. Around the central mass is a fringe, 50 to 75 miles wide, of sedimentaries, the oldest being Silurian. They are quite fossiliferous. Both the crystallines and the sedimentaries show the effects of extensive vulcanism.

The physiographic features described are: the fiords, the non-glaciated southern part of Jamesland, those of the coast-border, the central mass configuration of the country by glaciation, and fault valleys.

C. J. H.